

What is claimed is:

1. A pressure-elevating type fuel injecting system in which high pressure fuel from a pressure accumulating chamber is further pressurized by a pressure-elevating mechanism and is injected into combustion chambers by injectors, the pressure-elevating type fuel injecting system comprising:

a crank angle sensor producing crank pulse signals in accordance with operating states of an engine;

a pulse interval calculating unit calculating pulse intervals between respective crank pulse signals; and

a determination unit determining that the pressure elevating mechanism is malfunctioning when variations of the pulse intervals exceed a determination threshold.

2. The fuel injecting system of claim 1, further comprising a unit suspending the operation of the pressure elevating mechanism when the determination unit determines the malfunction of the pressure-elevating mechanism.

3. The fuel injecting system of claim 1, wherein the determination unit determines the pressure-elevating mechanism to be malfunctioning when crank pulse intervals depending upon engine states remain abnormal longer than a preset time period.

4. A pressure-elevating type fuel injecting system in which high pressure fuel from a pressure accumulating chamber is further pressurized by a pressure-elevating mechanism and is injected into combustion chambers by injectors, the pressure-elevating type fuel injecting system comprising:

a fuel supply pump supplying fuel to the pressure accumulating chamber;

a pressure regulating unit regulating fuel pressure in the pressure accumulating chamber by opening or closing a metering valve disposed in a fuel return path of the fuel supply pump;

a crank angle sensor producing crank pulse signals in accordance with operating states of an engine;

a pulse interval calculating unit calculating pulse intervals between adjacent crank pulse signals;

an opening-closing signal deviation calculating unit calculating deviations between actual opening-closing signals of the metering valve and a reference opening-closing signal corresponding to a target fuel pressure in the pressure accumulating chamber; and

a determination unit determining that the pressure elevating mechanism is malfunctioning when variations of the pulse intervals exceed a determination threshold, and the calculated deviation of the opening-closing signal exceeds an allowable deviation range.

5. The fuel injecting system of claim 4, further comprising a unit suspending the operation of the pressure elevating mechanism when the determination unit determines the malfunction of the pressure elevating mechanism.

6. The fuel injecting system of claim 4, further comprising a fuel injecting unit injecting fuel to the combustion chamber by regulating pressure of fuel in the pressure accumulating chamber to an allowable maximum pressure through the operation of the metering valve when the determination unit determines the pressure-elevating mechanism to be malfunctioning.

7. The fuel injecting system of claim 4, further comprising a fuel injecting unit injecting fuel to the combustion chamber by regulating pressure of fuel in the pressure accumulating chamber to an allowable maximum pressure through the operation of the metering valve and by regulating an amount of injected fuel when the determination unit determines the pressure-elevating mechanism to be malfunctioning.

8. The fuel injecting system of claim 4, wherein the allowable deviation range is increased in accordance with an increase of the target fuel pressure in the pressure accumulating chamber.

9. A troubleshooting method for a pressure-elevating type fuel injecting system in which high pressure fuel from a pressure accumulating chamber is further pressurized by a pressure-elevating mechanism and is injected into combustion chambers by injectors, the method comprising:

calculating pulse intervals between respective crank pulse signals;

calculating an average of pulse intervals of a preset number of pulses;

calculating variations of the average of pulse intervals;

determining whether or not the variations are above a reference

value;

determining whether or not the variations remain above the reference value longer than a preset time period; and

determining that the pressure elevating mechanism is malfunctioning when the variations are determined to be above the reference value for the preset time period.

10. The method of claim 9, further comprising:

detecting a reference opening-closing signal corresponding to a target fuel pressure in the pressure accumulating chamber, and an actual opening-closing signal for the metering valve when the pressure elevating mechanism is determined to be malfunctioning;

determining whether or not the actual opening-closing signal is within the allowable range; and

determining that the pressure elevating mechanism is malfunctioning when the actual opening-closing signal is out of the allowable range.

11. The method of claim 9, further comprising:

detecting an engine speed when the pressure elevating mechanism is determined to be malfunctioning;

regulating the fuel pressure in the pressure accumulating chamber to a preset maximum allowable pressure which depends upon the engine speed; and

regulating a fuel injection amount in accordance with the engine speed.